

# Knowledge Boundary Spanning Mechanisms in a Shared Services Centre Context

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Forthcoming in *Digital Services and Platforms. Considerations for Sourcing*, J. Kotlarsky et al. (Eds.), LNBIP 344, Springer, 2019

**Abstract.** This study focuses on the roles of knowledge boundary spanning mechanisms and intellectual capital (human, structural, and relational) in managing knowledge sharing in an IT-specialized shared services centre (IT-SSC) context. Although the literature stresses the growing utilization of the SSC as an outsourcing model, there is a lack of studies that examine the dynamic process of knowledge sharing across the organizational boundaries in this specific business model. Drawing on the literatures on SSC and on cross-boundary knowledge sharing we propose a conceptual framework based on four research propositions that were validated with primary and secondary data. The results suggest that IT-SSCs present high human capital, but encounter challenges developing relational and structural capitals. It also appears that IT-SSC management tends to prefer the utilization of boundary spanners and boundary objects instead of boundary discourses and boundary practices as mechanisms for efficient boundary spanning.

**Keywords:** Shared services centre, Knowledge boundary spanning mechanism, Boundary spanner, Boundary object, Boundary practice, Boundary discourse, Intellectual capital.

## 1 Introduction

To remain competitive, organizations are transforming the way they deliver their information technology (IT) services through the utilization of different sourcing approaches [24]. Among the different available business models of IT sourcing, some companies choose the Shared Services Centre (SSC) model. According to Schulz et al. [30], a SSC consolidates operational processes in order to reduce redundancies and costs, provide support processes, focus on internal clients, and represents a distinct organizational unit within the organization.

An SSC could be described as an independent, semi-autonomous organizational unit that provides services to various other organizational units, i.e. internal clients [22]. By using this arrangement, companies seek to optimize their processes, to generate value and to improve their services [4, 29]. A shared services centre enables a company to envisage the benefits of two worlds by using only one business model: (a) the world of outsourced processes and (b) the world of internal-based processes [1]. Nevertheless, combining the advantages of a fusion of different worlds can also result in a combination of the disadvantages of these two realities [17]. For example, Ulbrich and Schulz [35] identify several challenges that managers should overcome when implementing a SSC that delivers IT services (IT-SSC), including the issue of efficient knowledge sharing between IT and non-IT personnel.

It has been shown that knowledge sharing is an essential competence in the delivery of outsourced IT services [26] and that user involvement in defining IT needs is key to ensuring IT projects' success [13, 15]. Nevertheless, little research has been carried out specifically on knowledge sharing in the context of an IT-SSC in the extant literature [36].

To enhance understanding of knowledge sharing in this particular context, the concept of knowledge boundary spanning will be placed at the forefront. In this paper we consider boundary spanning as a process that involves several events and a combined effect of multiple spanning mechanisms [12]. Within an IT-SSC, the IT specialists and the knowledge related to the provided services are centralized in the same place. Therefore, we believe that a knowledge boundary is ubiquitous between the IT-SSC and the rest of the organizational units and that efficient knowledge sharing is important to maximizing the mutual performance of the IT-SSC and the organizational units. It has been shown that knowledge boundaries arise during collaborative efforts to find a solution to a problem [25].

The outcome, nonetheless, is not known in advance; rather, it is shaped by the interaction between the stakeholders during a knowledge-sharing process [6, 14].

The concept of knowledge boundary spanning has already been addressed in the context of IT outsourcing projects [11], as well as in relation to the development of information systems [15], but not in the context of an IT-SSC. Thus, we argue that there is a lack of explanation concerning the role of knowledge boundary spanning mechanisms in this specific organizational context. The work of Hsu et al. [15] lays emphasis on the fact that efficient knowledge boundary spanning, as part of an enterprise information systems development project, would significantly impact the quality of the system and of projects. These results lead us to believe that an IT-SSC would have a hard time optimizing the quality of their information systems and their services if it is not known how to efficiently span the knowledge boundary between the centre and the rest of the organizational units.

In general, spanning mechanisms – boundary object, boundary spanner [25; 37], boundary discourse, and boundary practice [12] – have been found to have an impact on the efficiency of crossing knowledge boundaries. Due to the specificity of the organizational structure of an IT-SSC, the implementation of mechanisms for efficient knowledge boundary spanning might differ from the way they are identified and applied within a traditional internal organizational structure. This assumption leads us to a first research question regarding the process of implementation of such mechanisms within the context of an IT-SSC:

***Q1:** How are the mechanisms for efficient knowledge boundary spanning used in an IT-SSC?*

A recent article concludes that “knowledge boundaries can be effectively spanned when strong intellectual capital exists within the organization” [15, p.291]. According to Stewart [31], intellectual capital refers to the intellectual content (e.g., experience, knowledge) that has been formalized, captured and extracted, enabling the organization to gain a competitive advantage through the optimization of the value of its assets. It has three dimensions: human capital, structural capital and relational capital [5]. Therefore, if intellectual capital has an impact on the efficient flow of knowledge between different organizational stakeholders, what would be its effect on the process of identifying and implementing the mechanisms for efficient knowledge boundary spanning in an IT-SSC context. Based on this argumentation we advance a second research question:

***Q2:** How can intellectual capital facilitate effective knowledge boundary spanning in an IT-SSC context?*

Our study allows us to better understand the process of knowledge boundary spanning in the context of an IT-SSC. We propose a conceptual framework that serves as an analytical tool to assess the relationship between the mechanisms for effective knowledge boundary spanning and the elements of intellectual capital by using a perspective of knowledge as embedded in practice [7]. Drawing on a systematic literature review that has enabled us to identify the major concepts developed in the context of a SSC and better understand the characteristics and challenges faced by SSCs, we propose a framework based on four research propositions. These research propositions were validated with primary data (semi-structured interviews with two experts in the domain) and with secondary data (published case study). The results our analysis suggest that IT-SSCs present high human capital, but encounter challenges developing relational and structural capitals. Nevertheless, it seems that some shared service centres might have the conditions for efficient development of relational and structural capitals. In addition, it appears that IT-SSC management tends to prefer the utilization of boundary spanners and boundary objects instead of boundary discourses and boundary practices as mechanisms for efficient boundary spanning.

The rest of this paper is organized as follows: In the next section, literature related to SSCs, IT-SSCs, knowledge boundaries, boundary spanning and intellectual capital is reviewed and research propositions are proposed. Next, the research method is introduced. Afterward, data analysis and discussion are presented and followed by conclusions.

## **2 Theoretical Background**

### **2.1 Shared Services Centres and IT-SSCs**

Delivering IT services has always been challenging for organizations [21]. Some organizations have opted for a succession of outsourcing methods via external service providers who combine the services offered to various organizations to generate economies of scale and improve their processes [8, 21]. Other organizations have decided to work independently by creating their own shared service centre (SSC) in which the selected organizational processes are consolidated within an organization, to reduce redundancies and provide support services to the various business units [23, 29, 33].

SSCs, which are service-oriented and focus on internal clients, operate as a separate and accountable semi-autonomous unit within an organization [4, 22]. SSCs represent an “insourcing arrangement” within organizations [22, p.92] and their implementation is often the preliminary stage of other outsourcing strategies [30]. SSCs represent a collaborative strategy focused on generating organizational value, promoting efficiency, reducing cost and improving service delivery to the rest of the organizational business units [14, 17].

Successfully implementing an IT-specialized SSC to obtain the benefits of shared services may be more arduous than expected [34]. Implementing SSCs, and specifically IT-SSCs, also gives rise to challenges, such as surmounting communication hurdles between IT and non-IT employees; addressing the failure to listen to users' needs; as well as managing the knowledge exchange between the IT-SSC and the organizational units [20, 34, 35]. Moreover, knowledge sharing is an essential skill for delivering IT services since each party, i.e. the organizational units and the IT-SSC, needs to understand the reality of the other to innovate, solve problems and provide adequate IT services. Nevertheless, little work<sup>1</sup> has focused specifically on knowledge sharing in the context of an IT-SSC [36] and efficiently crossing boundaries could play a key role in delivering specific IT services, such as those related to IT development projects [15].

## 2.2 Knowledge Boundaries

The presence of a knowledge boundary between organizational units makes it difficult to create a joint development of knowledge from several distinct units [12]. This situation prevails where there is an IT-SSC, because knowledge sharing between organizational units (i.e. the IT-SSC expert and the users in the business units) can represent a major challenge since knowledge has to cross the boundaries between these different entities. It is therefore imperative to better understand the basic concepts related to effective knowledge boundary spanning (EKBS). Adapting Hsu et al.'s [15] definition of EKBS to the context of an IT-SSC, EKBS can be defined as the interactions between IT-SSC staff and employees in organizational units aimed at achieving "effective syntactic knowledge transfer, semantic knowledge translation and pragmatic knowledge transformation" [15, p. 286].

We adopt the perspective which sees knowledge as localized, embedded, and invested in practice [6, 25]. Given the tacit and sticky nature of knowledge [7], the problems related to knowledge boundaries can be defined as "the knowledge delivery problems in which the tacit and sticky nature of localized knowledge may actually hinder problem solving and knowledge creation across functions. In practice, this specialization of knowledge increases the difficulty of collaborating across functional boundaries and accommodating knowledge developed in other practices" [15, p.283]. Thus, knowledge boundaries are not static and they adjust to environmental learning structures and to the social and material interactions of individuals [12].

## 2.3 Boundary Spanning and its Mechanisms

To further understanding of knowledge sharing in IT-SSCs, it is appropriate to place the boundary spanning concept at the forefront. In such a context, effective knowledge sharing becomes essential to maximizing the mutual performance of both the organizational units and the IT-SSC [15]. As mentioned by Ulbrich and Schulz [35], one key challenge related to IT-SSCs is tied to the nature of the communication between IT and non-IT employees. Although communication problems seem to be distinct from those of knowledge sharing, there is a link between communication and knowledge management challenges because, as reported by Ulbrich and Schulz [35], sometimes IT-SSC staff hide behind their technical jargon during exchanges with organizational units.

To effectively manage knowledge across boundaries, Hawkins and Rezazade [12] propose a spanning process, characterized by multiple actors and the adoption of four complementary spanning mechanisms: 1) *boundary spanners*, i.e. "human agents who translate and frame information from one community to another in an effort to promote coordination (p. 1803)"; 2) *boundary objects*, i.e. "physical, abstract, or mental object that serves as a focal point in collaboration enabling parties to represent, transform and share knowledge (p. 1805)"; 3) *boundary practices*, i.e. "a boundary spanning mechanism that overcomes a knowledge boundary by engaging agents from different knowledge communities in collective activities (p. 1806)", and; 4) *boundary discourse*, i.e. "the content of knowledge that shapes the dialogue among the experts from distinct domains" (p. 1807).

More specifically, boundary spanners could use their competence and their social capital, to translate knowledge, frame it and provide legitimization to EKBS [37]. Boundary objects such as, standardized forms, narratives or routines, could help develop shared meaning across boundaries, as well as reinforcing and objectifying knowledge that is crossing boundaries [25]. Boundary practices are novel activities which provide a context where individuals can engage in learning, understanding, internalizing and co-creating tacit and situated knowledge [36]. Finally, boundary discourses focus on the domains of knowledge exchanged across boundaries, and how explicit knowledge

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<sup>1</sup> The authors conducted a systematic review of the literature on SSCs and IT-SSCs in the Elsevier and ABI/INFORMS databases following Templier and Paré's [32] recommendations. The review focused on peer-review articles on the topics of SSCs and IT-SSCs. A total of 52 articles (30 journal articles, 18 conference papers and 4 book chapters) were identified. Seventeen articles focused on IT-SSCs and none of them were in the AIS basket of eight. Only five articles cover the topic of knowledge management in SSCs and one slightly touches on this topic in relation to IT-SSCs [35].

is transferred and translated across boundaries to fill knowledge gaps [12]. Thus, as knowledge boundaries arise during collaborative work, the final results of such work are shaped by the interactions of individuals. The integration of the four spanning mechanisms could be used to analyze and clarify how knowledge crosses boundaries between an IT-SSC and organizational units. However, because the relationship between IT-SSCs and organizational units can be knowledge intensive and knowledge is considered a key resource [33, 35], the concept of intellectual capital [31] could also enhance understanding of EKBS in the context of an IT-SSC.

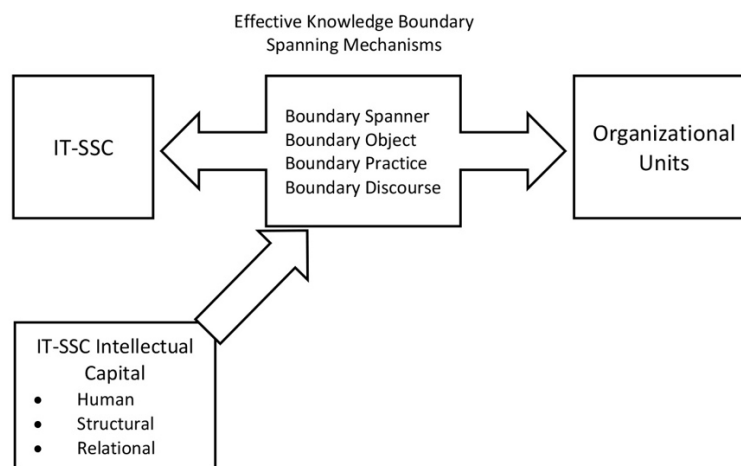
## 2.4 Intellectual Capital

Intellectual capital can be defined as the “intellectual material that has been formalized, captured, and leveraged to create wealth by producing a higher-valued asset” [5, p. 440] and encompasses three types of sub-capital: 1) *human capital*, i.e. the “tacit knowledge embedded in the minds of the employees”; 2) *structural capital*, i.e. “the organizational routines of the business”; and 3) *relational capital*, i.e. the knowledge embedded in the relationships established with the outside environment (p. 444). Hsu et al. [15] argue that, in IT development projects, users and developers must cope with knowledge boundaries. The authors argue that intellectual capital, expressed through 1) mutual understanding, i.e. relational capital; 2) participative decision-making, i.e. structural capital; and 3) mutual user-IT understanding, i.e. human capital, can bridge knowledge boundaries between users and IT developers. Their study shows that intellectual capital can facilitate knowledge boundary spanning because “it can effectively promote syntactic knowledge transfer, semantic knowledge translation, and pragmatic knowledge transformation (p. 293).” Because effectively crossing knowledge boundaries is paramount to organizational structures that deliver IT services and because IT-SSCs are isolated from other organizational units, adopting an intellectual capital lens to explore knowledge sharing in the specific context of IT-SSCs could be illuminating.

## 3 Conceptual Framework and Research Propositions

Because IT-SSCs deliver various IT-based services to other organizational units [35], the IT-SSC is therefore expected to be able to carry out effective knowledge boundary spanning as optimally as possible. Yet, due to the nature of the knowledge integral to the IT-SSC's practices, the EKBS process becomes more complex. Thus, several EKBS mechanisms can be mobilized intermittently over time. Moreover, it has been suggested that intellectual capital can facilitate EKBS [15].

As IT-SSCs have specific characteristics, we have developed a conceptual framework (see Figure 1) that will enhance understanding of the relationships between the intellectual capital components and the boundary spanning mechanisms involved in the knowledge sharing between an IT-SSC and organizational units. We suggest that the process of cross-boundary knowledge sharing is mediated by boundary spanning mechanisms and the utilization of a specific mechanism or a mix of mechanisms will be influenced by the existing levels of the three intellectual sub-capitals (human, structural, and relational) within the IT-SSC.



**Figure 1. Conceptual Framework: Knowledge Sharing Process in SSC context**

Thus, given a context of low intellectual capital, an organization could more actively mobilize its boundary spanning mechanisms to promote EKBS. On the other hand, the use of boundary spanning mechanisms could promote the development of intellectual capital during EKBS. Since IT-SSCs have specific characteristics, structures and roles [e.g., 33, 35], as compared with other organizational units, we can conjecture that the dynamics of intellectual capital within IT-SSCs differs from that within other organizational units. Thus, given that such dynamics can impact EKBS [15], the research propositions developed hereafter will focus on how the intellectual capital within IT-SSCs relates to the effective crossing of knowledge boundaries.

### 3.1 Proposition #1 - The Human Capital of IT-SSCs

Given the idiosyncrasies of IT-SSC, it can be argued that IT human capital will be more prevalent among the IT-SSC developers than among the other organizational unit users. Since they focus primarily on internal clients, it is highly likely that IT-SSC developers will learn, and be particularly aware of, their clients' business needs. Thus, as pointed out by Schulz et al. [29], the IT-SSC developer will develop business knowledge about the organization, its units and its processes. This characteristic will help IT-SSC developers deliver IT services adapted to internal clients' realities and needs. Although the work of IT-SSC developers should be mainly oriented towards developing solutions for internal clients, some developers might, in fact, know little about the client's real needs. It appears that conflicts between an IT-SSC and organizational units can emerge due to the failure of IT-SSC developers to listen to users' needs [17].

One organizational motive for implementing an IT-SSC is the fact that, with such SSCs in place, organizational units can concentrate on their specific roles and functions [16]. Once organizational units can focus on their primary mission, users from these units have less opportunity to develop their IT-related knowledge.

Thus, we propose an initial research proposal:

**P1:** *Given that the primary role of an IT-SSC is to deliver IT services to internal organizational units, the IT-SSC will tend to have higher IT-related human capital than the other organizational units.*

### 3.2 Proposition #2 - The Structural Capital of IT-SSCs

Several indications may lead us to conclude that, by its nature, an IT-SSC would have a negative impact on the participation and the perceived authority of users in decision-making related to IT developments. Indeed, with the implementation of an IT-SSC, the power and responsibilities of the organizational units relative to IT would be decreased because of its transfer to the IT-SSC. Formerly located within each organizational unit, the IT developers would now reside within a single organizational unit, i.e. the IT-SSC. Such staff transfer could result in a loss of control and influence for the organizational units relative to IT decision-making. Moreover, the principal-agent relationship [9] within an IT-SSC is particular as: 1) the principal and the agent operate within the same organization, and 2) the relationship, which exists between several clients and a single vendor, creates a sort of monopoly. Thus, since the IT-SSC becomes the only IT service provider for several organizational units, the IT-SSC is placed in an advantageous position relative to IT decision-making.

Nevertheless, structural capital could possibly vary within an organization depending on the degree of customization of the services provided by the IT-SSC [20]. For example, IT-SSCs which have business value based on knowledge and are business-oriented would have more customization and provide a business model customized to the reality of each organizational unit. Such a high level of customization is associated with a more decentralized IT governance structure [19].

Thus, we believe that structural capital and the participation of organizational unit users in IT decision-making could be more prominent in IT-SSCs where the governance structure is decentralized and where the level of customization of the IT services is higher. Inversely, IT-SSCs characterized by a low level of IT services customization and a more centralized governance structure will have low structural capital. Based on the above argument, the second research proposition we are advancing is the following:

**P2:** *The monopoly position of an IT-SSC with respect to the other organizational units diminishes the influence of the organizational units on IT decision-making, which would have a negative impact on structural capital.*

### 3.3 Proposition #3 - The Relational Capital of IT-SSCs

Several indications suggest that IT-SSCs may face some challenges linked to relational capital. For example, the lack of trust and the frustration of internal clients with respect to IT-SSCs that Janssen and Wagenaar [18] have

pointed out suggest the interactions between IT-SSC developers and organizational units' users, as well as their levels of mutual trust, would tend to be very low. Indeed, mutual trust is not automatically present when an IT-SSC is implemented. It must be developed over time through interactions. Having lost part of their IT staff to the IT-SSC, organizational units may hesitate to trust a new and separate organization that does not have a proven track record. This situation could undermine the basis for mutual trust between users and IT-SSC developers.

In addition, IT-SSCs have management controls which differ from those of other organizational units: they have internal hierarchical controls as well as controls related to the market mechanisms active within the organizational units [27]. We believe that these market-related controls could impede the quality of relationships between IT-SSC members and the organizational units by placing additional pressure on the IT developers' work. The user-pays principle may also reduce the quality of relationships between organizational units and the IT-SSC. Indeed, to minimize costs, organizational units may be tempted to minimize interactions with the IT-SSC and undermine a mutual and trusting relationship. Thus, we propose a third research proposition:

**P3:** *The user-pays principle would have a negative impact on relational capital. This would put additional pressure on the IT-SSC to minimize prices.*

### **3.4 Proposition #4 – Effective Knowledge Boundary Spanning Mechanisms in IT-SSCs**

According to Hawkins and Rezazade [12], there are four categories of mechanisms for effectively crossing knowledge boundaries. We consider, as proposed by these authors [12], knowledge crossing between boundaries to be a process that involves and integrates complementary EKBS mechanisms: spanners, objects, practices and discourse. As the nature and structure of IT-SSCs makes it challenging to develop strong intellectual capital and since intellectual capital is a factor that favours EKBS [15], IT-SSCs should benefit from optimizing EKBS mechanisms. Thus, because the nature and structure of IT-SSCs differ from those of other organizational units, we argue that the way EKBS mechanisms are deployed in an IT-SSC will differ from the way they are deployed in other organizational units.

EKBS mechanisms include, firstly, *boundary spanners*. These are individuals who translate and reformulate information passing from one group to another to facilitate coordination and problem solving [25]. Such individuals are knowledgeable about both the business context and the IT services. In the case of IT-SSCs, as all IT specialists are centralized under the same roof, IT developers might sometimes find it difficult to express themselves in simple, understandable language during exchanges with organizational units. Boundary spanners could possibly better translate IT knowledge passing to and from organizational units and IT developers. Alternatively, boundary spanners could facilitate domain-specific communication from organizational units' users to IT-SSC developers. In this way, boundary spanners could increase users' confidence in the IT-SSC and lead to an increase in relational capital.

The second mechanism is *boundary objects*, which are common objects shared by different groups that allow them to represent, transform and share knowledge [25]. These boundary objects could be particularly relevant in the context of IT-SSCs. Because their services are intangible, it can be challenging for IT-SSC developers to describe the IT services they offer and deliver to organizational units. Thus, boundary objects could allow both stakeholders, i.e. developers and users, to better understand and become aware of this intangible IT knowledge. For example, detailed service level agreements between IT-SSCs and organizational units would be beneficial for facilitating dialogue between parties. The use of a boundary object facilitates the description of services by enabling IT-SSCs and organizational units to communicate their needs and constraints related to services rendered via a familiar object common to all.

*Boundary practices*, the third mechanism, allow for the creation of new knowledge through the collective commitment of parties to the practice of common activities [15]. Working together facilitates the sharing and modification of knowledge across borders. Faced with practical problems, participants in each group modify their knowledge collectively. However, this EKBS mechanism might be more complex and challenging to introduce in the context of IT-SSCs. Indeed, as the main objective of IT-SSCs is to centralize IT activities, standardize them and pool expertise under one roof, merging the practices of IT users and developers might distort the very nature of IT-SSCs. By working in conjunction with organizational units, an IT-SSC could integrate boundary practices as a method of sharing knowledge.

*Boundary discourses*, the fourth mechanism, refers to the content of knowledge that characterizes exchanges between experts in different groups. This relates to the way language itself is used to allow knowledge to cross borders. Boundary discourse is a mechanism that can be challenging for IT-SSCs. Centralizing IT expertise under one roof, may encourage IT specialists to develop specialized jargon which they can use to communicate among themselves. However, such a context might render the interactions with organizational units more difficult and

complicated [35]. Nevertheless, it seems that the developers in IT-SSCs would benefit from taking stock of the boundary discourses of organizational units to develop solutions which reflect the organizational unit's discourse. Thus, IT developers should express themselves using terms that are easier for organizational units to understand. Based on the above argument, we propose a fourth and final research proposition:

**P4:** *To promote EKBS, IT-SSCs should mobilize boundary spanners and boundary objects and, to a lesser extent, promote boundary practices and boundary discourse.*

## 4 Methodology

As little research has been done on knowledge sharing in IT-SSCs [36], the four research propositions, which juxtapose the concepts of intellectual capital and EKBS mechanisms, have been analyzed using two different sources of data: 1. Secondary data (an existing case study); 2. Interviews with experts.

The case study, which focuses on an IT-SSC, is a doctoral thesis titled "Realizing Shared Services - A Punctuated Process Analysis of a Public IT Department" [28]. Using a process case analysis approach and a punctuated socio-technical IS change model, this thesis was developed to enhance understanding of how an IT department can be transformed into an IT-SSC. Based on an ethnographic field study, it provides a rich set of primary data as well as "a narrative account of the process of realizing IT-SSs, a normative process model grounded in empirical data, and lessons for practitioners" [28, p. 19]. The case study focuses on an IT department (Uni-IT) in a large American university, with approximately 210 employees, which was facing "pressure from the many university departments and colleges to show cost accountability and provide visibility regarding how IT funds were being used" [28, p.13]. The transformation from an IT department to an IT-SSC took place over a period of 24 months. To provide external validity to the case study, interviews with IT-SSC experts were conducted to triangulate the data [10].

Proposition	Keywords Used	References
1#	Knowledge; Competency; Customer; Business unit; Services	[15]
2#	Meeting; Business unit; Decision; Influence; Dependency; Monopoly	[15]
3#	Customer relationship; Working relationship; Cost	[15]
4# - <b>Spanner</b>	Consultant; Principal; Politics and power relations	[12, 25]
4# - <b>Object</b>	E-mail; Quote; Shared Meanings	[6,12]
4# - <b>Discourse</b>	Lexicon; Vocabulary; Description	[12]
4# - <b>Practice</b>	Do together; Collective activities; Co-creation	[12]

**Table 1. Coding List**

In the first phase of reviewing this study, Olsen's [28] thesis was read several times to ensure familiarity with the case study's content. Then, for each research proposition, citations and explanations providing support were identified, with focus being confined to one proposition at a time. Throughout this iterative process, keywords were identified as a way to help circumscribe citations for each proposition (see Table 1). Reviewing the case study one proposition at a time allowed us to identify common points, redundancies and contradictions.

In the second phase of the review, to evaluate the relevance of our research propositions and the results of the case study, two semi-structured interviews with two IT-SSC specialists were conducted. These interviews enabled us to compare the research propositions and the chain of evidence extracted from Olsen's [28] case study with the experience and knowledge of two IT-SSC experts<sup>2</sup>.

## 5 Data Analysis

### 5.1 Secondary Data – Case Study

#### Proposition #1 – Human Capital

In IT development, human capital represents, in large part, the developers' knowledge of the clients' context and business needs [3]. In the Uni-IT case study, some IT-SSC employees worked daily and directly with the various

<sup>2</sup> One respondent was an IT vice-president with 15 years of IT-SSC experience and the other one was an assistant vice-president with 20 years of experience in IT-SSC.

organizational units because they needed to understand their reality and needs to guide them and "educate" them, in particular, about the implications and the cost of IT. As explained by one facilitator:

*"I was just going to say that I think the dilemma is trying to scope the project right up front. Most of our customers have a champagne and caviar appetite and they have a hamburger and Coke checkbook.[...] So the thing is you have to educate them right up front" [28, p. 161-62].*

It seems that organizational units have little IT knowledge and are more focused on their primary mission. It is the IT-SSC employees who are responsible for informing their clients of the value of their various services and what may best suit their needs. At Uni-IT, some individuals are more likely to guide organizational units on a day-to-day basis, i.e. consultants and principals, since they work in conjunction with the organizational units and bridge the gap between the organizational units and the IT-SSC. In particular, their knowledge regarding the organizational units' functional needs highlights the importance of Uni-IT's intellectual capital to EKBS between the IT-SSC and the organizational units. Indeed, since the role of consultants and principals is to support the organizational units, they acquire a clear knowledge of the administrative and functional reality of each unit.

Thus, human capital seems to be paramount at Uni-IT and is reflected in the valorization of the service culture which underscores the need for the IT-SSC to understand the needs of the organizational units: "The result of service-thinking was a paradigm shift from task performance – "what I do" – to service provision – "what I deliver"" [28, p. 106]. Such a paradigm shift requires that Uni-IT must no longer work in silos, that IT-SSC employees become familiar with their clients' characteristics and that this knowledge be developed by Unit-IT managers:

*"In addition to learning their own individual roles, managers had to learn new skills such as presenting quotes to customers, answering customer inquiries about cost, conducting detailed internal budgeting, and buying and selling internal services" [28, p. 122].*

Knowledge of the IT-SSC clients' needs also influences how work is organized at Uni-IT: "Prior to this, managers would often only sell the services that they provided; thereby the organization would lose the opportunity to meet the needs of the customer with other services" [28, p. 68-69]. The paradigm shift helped the IT-SSC better understand and guide its clients:

*"We really have to train our people to take that lexicon out of their vocabulary. We have to train them to say that, 'Morgan now does that,' not, 'I don't do that.' Or, 'Let me transfer you now' or, 'I can take that request to them for you,' or something to help it get there, but 'I don't do that anymore,' can't be an acceptable response"[28, p. 87].*

In order to properly guide the organizational units, the IT-SSC's human capital must be expanded as much through knowledge of the customer's reality as through knowledge of the different specialties of the organization. As the case study states, "several times managers expressed the importance of knowing the others' roles to allow for lead passing" [28, p. 88]. Thus, the secondary data seems to provide support for the first research proposition, since the IT-SSC at Uni-IT seems to have higher IT-related human capital than the other organizational units.

## **Proposition #2 –Structural Capital**

Structural capital relates to organizational routines which promote interactions between individuals such as, for example, the active participation of stakeholders in decision-making. At Uni-IT, the SSC is a monopoly as there is only one IT supplier, namely, the IT-SSC, which has several clients, namely, the organizational units. Thus, this situation has created greater interdependence between the IT-SSC and the organizational units, and requires more interaction between them. With the introduction of the IT-SSC at Uni-IT, redundant services were eliminated and each service offered by the IT-SSC became distinct because the IT-SSC structure "was designed to allow each manager to develop expertise and provide services within specialized domains" [28, p. 95]. For instance, weekly meetings, called "walkthroughs," between different IT-SSC managers were conducted:

*"Walkthroughs were described as communicating understanding of "who will be doing what, for whom, in relation to the delivery of products and services. By rehearsing key business processes by conducting dozens of walkthroughs, Uni-IT had a smoother transition from task to service-oriented delivery" [28, p. 107].*

This structural mechanism was also used to coordinate and identify which services provided by internal managers would need to be pooled to meet the demands of an organizational unit. Such mechanisms "reinforced manager responsibility and enabled each manager to be aware of how their services might be able to be bundled to meet the needs of a client" [28 p. 120]. However, walkthroughs did not include any organizational units' representatives and no meetings were held at Uni-IT to promote the influence of clients on decision-making. As a result of dealing with



the IT-SSC monopoly, organizational units' managers appear to feel threatened or inferior, as one manager pointed out:

*"I think there are some folks around campus who are threatened by the whole process: Uni-IT is starting to know what it costs to run their shop, and I have no idea how much it costs to run my shop or where my money goes" [28, p. 108].*

However, the IT-SSC seems to have been sensitive to its monopoly position and responded to the clients' criticisms by taking necessary actions to meet their needs. For instance, following an iPad implementation project that would allow new students to enroll in the classroom, the CIO and other IT-SSC managers received an email from the organizational unit manager client complaining about the cumbersome nature of the estimates and the "wasted" time spent establishing estimates that were neither revealing nor helpful to the client. The following day, the head of the IT-SSC contacted all IT-SSC managers and told them:

*"We would like to use the next leadership team meeting to walk through the initiation of this project and determine any lessons that can be learned in order to improve the process for future project requests from customers" [28, p. 80].*

Although, Uni-IT clients do not seem to have a particular role to play in the major decision making process and are not part of the walkthroughs, it seems that their criticisms of the IT-SSC are taken seriously as actions have been taken to meet the clients' needs. Thus, the secondary data seems to provide support for the second research proposition, since the monopoly position of the IT-SSC with respect to the Uni-IT organizational units seems to have diminished the latter's influence in the IT decision-making process and simultaneously have a negative impact on Uni-IT's structural capital.

### **Proposition #3 – Relational Capital**

Relational capital refers to interactions, respect and mutual trust with the external environment. The fact that the IT-SSC at Uni-IT billed organizational units for their services allowed units to compare the price paid with similar services on the market. Many organizational unit managers did not understand why they should now have to pay for services that had cost them nothing in the past. The constant price justification and the comparison with services offered on the market created tension during interactions. In addition, several IT-SSC managers suspected that the imposition of service billing could alter their relations with the organizational units, as reported by one IT-SSC manager:

*"If we want to ruin our PR related to our restructuring, the best thing for us to do is to go out there and relate it to doing fee for service. We've all kind of jumped on this bandwagon like we're ready to go out there and start charging for things where we haven't charged for them in the past" [28, p. 157].*

However, IT-SSC managers' hands-on experience with the process of estimating quotes has enabled them to develop interpersonal skills that reduce the tensions created, as outlined by one manager:

*"It was six months (after announcement day) before I felt like I owned my business enough to actually be an entrepreneur. Because, I'm trying to understand my business and what my role is in the organization and how I interact with customers and with my coworkers" [28, p. 89].*

Nevertheless, to respond to this threat of altering their relationships with organizational units, IT-SSC managers made undeniable efforts to minimize costs and simultaneously minimize the amounts billed to customers: "I think we underestimated the finesse that it takes, you learn that every time I quote a price to someone there is a little dance that happens" [28]. Managers are anxious about the idea of proposing a costly estimate higher than the client's budget or higher than comparable services on the market [28].

Thus, Olsen's [28] case study supports the third research proposition, since the ubiquitous user-pays principle in the IT-SSC seems to have negatively impacted Uni-IT's relational capital, and put pressure on the IT-SSC to minimize its prices.

### **Proposition #4 – Effective Knowledge Boundary Spanning Mechanisms in IT-SSCs**

In the Uni-IT case study, consultants and principals acted as *boundary spanners* for clients:

*"The consultant was charged with being the public face of the organization, meeting with customers to determine their needs before bringing these needs back to the leadership team where managers would then identify who would be the "prime" (e.g. prime contractor) on the project and the individual managers whose services were requisite to complete the project" [28, p. 68].*

After the deployment of the IT-SSC at Uni-IT, it was no longer the first randomly selected individual from the IT department who took the initiative to help and serve an organizational unit, but rather a consultant specialized in the analysis of the client's needs was appointed to this role. Therefore, consultants were generalists who had global

knowledge of the IT-SSC's services and who would guide organizational units according to their particular needs. The IT-SSC became a one-stop shop, facilitating communication and knowledge transfer between organizational units and the IT-SSC. Thus, the secondary data supports the first part of the fourth research proposition, which asserts that IT-SSCs should mobilize boundary spanners to promote EKBS.

One *boundary object* used at Uni-IT was the emails used to communicate between the IT-SSC and organizational units. For instance, the administrator of the student orientation service wrote an email to the CIO and other IT-SSC managers informing them of the poor quality of the costing process. The next day, the CIO sent an email to the IT-SSC managers asking them to identify solutions that would improve the process for future client requests [28]. This email served as a trigger to sensitize managers to this reality and, as reported by one IT-SSC manager, the email: “stated a few ground rules for the meeting: The customers’ perception is reality. The focus of the discussion will be on those items that Uni-IT can control” [28]. A second boundary object used by the IT-SSC was the service quotations which were used to communicate the detailed cost description for an IT service. The quotations allowed organizational units to clearly identify the nature and scope of IT services and their costs. It helped the two entities to work on shared concerns because it provided a detailed description of the IT services and helped the IT-SSC managers explain those services. The quotations helped IT-SSC managers refine their interventions and adapt the IT services offered to the organizational units’ needs and budgets, because the clients could accept, negotiate, amend or refuse the service conditions. This tool facilitated discussion by using a common focal point that everyone could adjust as they saw fit:

*“On several occasions debates between meeting facilitators and engineers arose on the subject of costing. Engineers favored taking time to gather requirements while facilitators favored getting a rough estimate back to the customer as soon as possible. Both had strong arguments” [28, p. 84]*

The CIO argued that the role of the quotations was to show the organizational units the importance of IT services and clarify the options available and the associated costs. Thus, the second part of proposition #4 seems to be supported by the case study, given that the IT-SSC at Uni-IT mobilized boundary objects to facilitate EKBS.

*Boundary discourses* refer to the content of knowledge that shapes the dialogue between experts in different fields. In the case study [28], IT-SSC employees seemed to make an effort to adapt their approaches and vocabulary during their exchanges with the organizational units. For instance, IT-SSC employees realized that their approaches and vocabulary could create confusion among organizational units:

*“We really have to train our people to take that lexicon out of their vocabulary. We have to train them to say that, ‘Morgan now does that,’ not, ‘I don’t do that.’ Or, ‘Let me transfer you now’ or, ‘I can take that request to them for you,’ or something to help it get there, but ‘I don’t do that anymore,’ can’t be an acceptable response” [28, p. 84]*

Thus, based on the case study, the third part of research proposition #4 seems to be upheld, given that the IT-SSC tended to promote boundary discourse.

Finally, *boundary practices* favor engagement in collective activities that allow the generation of common knowledge. In the Uni-IT case study, the IT-SSC does not seem to have developed boundary practices with organizational units. Indeed, the thesis analysis does not allow us to identify any mechanisms that promoted EKBS through specific practices, since the study focuses on the transformation of an IT department into an IT-SSC rather than on boundary practices.

On the other hand, it would not be surprising to find there were no boundary practices at Uni-IT since the main objective of an IT-SSC is to centralize IT services by standardizing processes and developing IT expertise in a common organization. Implementing boundary practices would distort the goal of consolidating similar activities within one organization and streamlining organizational units so that they can concentrate on their primary missions. Thus, no support for the fourth part of the proposition was identified.

## 5.2 Primary Data - Expert Interviews

### Proposition #1 – Human Capital

Proposition #1 implies that, since the main function of an IT-SSC is to deliver IT services to its customers, it must have highly competent employees, demonstrating leadership and intellectual agility [15]. Generally, the experts interviewed agreed with the first research proposition and mentioned that recurrently conducting business with the same client (i.e. organizational units) allows IT-SSC employees to develop and acquire strong human capital.

Nevertheless, Expert #1 mentioned that, one key factor that helps optimize human capital development is to have a low turnover rate in the IT-SSC. He argues that relying on employees that have been around for a long time in the IT-SSC helps to optimize its human capital. Thus, an IT-SSC does not automatically have a high level of human capital and the presence of "senior" employees could favor more human capital:

*"In general, we have people who are very familiar with it [the IT-SSC] and this makes a big difference. [...] Because they are able to make the connection with what is happening in the business, not just the systems" [translation from French] (Expert #1).*

In addition, Expert #2 indicated that the way in which IT-SSCs are structured could impact their human capital: some are organized along technological lines, while others develop teams based on the clients' business needs:

*"Often the structure of IT-SSCs is oriented towards the technology [that they service]. I would say that the most effective [teams] are those that are oriented toward business units, but again, it depends on the context. This is not always feasible or desirable" [translation from French] (Expert #2).*

Such IT-SSCs would be classified as decentralized rather than balanced and, in such a context, it would be easier to develop human capital. Thus, the interviews support the first research proposition since the IT-SSCs that do business with the same clients, on a recurring basis, have a high level of human capital. However, the turnover rate and the organizational structure of an IT-SSC can affect its level of human capital.

### **Proposition #2 – Structural Capital**

This proposition posits that the monopoly position of an IT-SSC vis-a-vis organizational units could reduce the influence of organizational units on decision-making and negatively impact structural capital. Expert #1 argued that IT-SSCs must be monopolies to avoid duplication, to prevent the development of separate technological platforms that cannot communicate, and to prevent incrementally increasing the operational cost of IT (through the presence of multiple platforms):

*"Yes, this limits the client's influence. It limits their decision-making, they do not have the same freedom, because they are "forced" to do business with us because we want to ensure cohesion and avoid IT chaos" [translation from French] (Expert #1).*

Further, Expert #1 mentioned that, in the long run, the IT-SSC monopoly tends to eliminate information silos and promote information flow. It also limits client decision-making for the purpose of "reducing costs and ensuring the sustainability of all systems"(Expert #1). Expert #2 provided a more nuanced explanation, arguing that the client's difficulties in making decisions in the context of an IT-SSC structure is not necessarily related to the monopoly itself but to the fact that there is often more than one organizational unit involved in an IT project:

*"Even if they had their choice of IT provider, they would have to choose an IT provider for a particular problem, except that the business expertise required to perform the query is in several organizational units; the complexity is there, it isn't the monopolistic position that is the problem" [translation from French] (Expert #2).*

Thus, the second research proposition seems to be partially confirmed as it was referred to from two complementary perspectives by the IT-SSC experts. Thus, the explanation proposed by Expert #1 seems to relate to underscores the fact that the SSC must play a key role in managing the decisions of organizational units to optimize global processes and systems, as well as to ensure the IT-SSC's effectiveness. On the other hand, Expert #2's explanation seems to stress the importance of less a process standardization and a greater flexibility, allowing for more focus on clients' needs and simultaneously creating more room for shared decision-making.

### **Proposition #3 – Relational Capital**

This proposition posits that the user-pays principle could have a negative impact on the relational capital as it would put additional pressure on the IT-SSC to minimize prices. The two experts agreed with this proposition. Nevertheless, they stressed that not all IT-SSCs necessarily had to integrate the user-pays principle. Indeed, they mentioned that, when the user-pays principle is present, relationships are more difficult to maintain. For instance, Expert #1 highlights the fact that some of the IT-SSC's clients complained about the high pricing of services delivered and mentioned that they could be delivered at a lower price by an external provider. However, clients forgot to compare the quality of the service rendered:

*"[Clients] compare this with one of their competitors who has a system that they have purchased, but it is local. Thus, if they lose their local server, the competitor can no longer serve its clients. We are centralized. We have an infrastructure in place, we have high availability centres, that means that all the data are copied to the second in two centres that are in two different physical places. So the system is practically never down" [translation from French] (Expert #1).*

These altercations with the different organizational units undoubtedly put pressure on the IT-SSC to minimize its prices: *"We have to be very careful about our costs because they never stop telling us: "You are expensive! You are expensive!" (Expert #1).*

On the other hand, the two experts interviewed also highlighted the possibility, for some IT-SSCs, of not using the "bill back" or user-pays principle. For instance, there are some organizations in which *"there is a budget, it is the IT budget [of the IT-SSC] and ...according to established priorities by the IT-SSC and the organizational units, the money is spent"* (Expert #2). Thus, by not exploiting the user-pays principle with its clients the IT-SSC will enhance the quality of its relationships.

Thus, the third research proposition seems to be partially confirmed since relational capital is not automatically minimized by the application of the user-pays principle. Based on the interviews, it seems that IT-SSCs that rely on a user-pays approach have more difficult relationships with organizational units and such IT-SSCs could be observed to make efforts to minimize costs. Nevertheless, since SSCs that are somewhat decentralized tend to place less emphasis on costs, it seems that they might not automatically apply the user-pays principle. This approach could favor a less conflictual relationship between the IT-SSC and the organizational units. However, it could create an impression among clients that IT services are free and the effort to ensure a return on investment would be minimized.

#### **Proposition #4 – EKBS mechanisms**

The presence of *boundary spanners* between IT-SSCs and organizational units facilitates EKBS according to the two experts, who tend to mobilize liaison officers on both sides of the knowledge border, – one business liaison officer and one IT liaison officer:

*"We work hard to ensure that IT analysts working with business units have business expertise in the sector they work with [...] and on the other hand, organizational units have a so-called "business unit representative." This is the person who initiates the requests" [translation from French] (Expert #2).*

According to the experts, the boundary spanners should be senior analysts who must be able to understand the discourse of organizational units and to see beyond the discourse to truly understand the client's needs and translate these for their IT-SSC colleagues:

*"Someone can say something and the other person interprets it according to his experience, but the speaker, with his experience, did not mean the same thing. So you have to be able to get past that and really listen [to the customer]" [translation from French] (Expert #1).*

Thus, the experts highlighted the fact that IT-SSCs tend to mobilize liaison officers to promote EKBS, which supports the first element of the fourth research proposition.

The use of *boundary objects* by IT-SSCs to promote EKBS was highlighted in the interviews. The two experts proposed the use of a COBIT-based development methodology to structure the way IT-SSCs can do business with organizational units during the stages of the IS development process. Organizational units must be familiar with the boundary objects, which would include statements of work, functional analyses, etc., and these must be approved by them:

*"All business units have been trained in this to understand the methodology, but also to understand what documents will be used to accurately exchange information and ensure that business units are able to approve their content" [translation from French] (Expert #2).*

These documents are the backbone of the IT development methodology, and they make it possible to ensure that the organizational units' needs and the IT-SSC's constraints are well understood on both sides. In addition, the IT-SSC may use prototypes:

*"Depending on the complexity of the request we will make prototypes that we will work on with the users, saying there are new systems, new screens to be added, here is how it would work, so that they can visualize it" [translation from French] (Expert #1).*

Thus, to promote EKBS, the interviewed experts indicated that IT-SSCs mobilize boundary objects, and this supports the second element of the fourth research proposition.

*Boundary discourse* seems to be a pervasive challenge in the IT-SSC context. Although boundary objects can use a simple and vulgarized vocabulary to ensure everyone's understanding, it seems that the vulgarization of discourse by IT-SSC employees is more complex than this would imply, as pointed out by Expert #2:

*"Yes, this is a constant challenge, it is more challenging in some places than in others. It depends on people. Some are more technical than others." [translation from French]*

Nevertheless, the fact that some IT-SSCs use the same representative to interact with a given business unit allows the business unit to become more familiar with the IT vocabulary and concepts and thereby promotes understanding of the IT-SSC discourse. Moreover, the fact that boundary spanners must develop expertise related to the business unit enables them to develop a boundary discourse adapted to the needs of their clients. Thus, the interviewed

experts supported the third element of the fourth research proposition, by pointing out that, to promote EKBS, IT-SSCs tend to favor liaison officers and objects over discourses.

According to the two experts interviewed, *boundary practices* could be used by IT-SSCs to promote EKBS. Nevertheless, this mechanism is used in specific cases: major and complex IT projects. For instance, in large and complex IT projects, IT-SSCs could encourage organizational units affected by the project to release one or more of their full-time employees so that they can come to work in the IT-SSC during the project. However, this strategy does incur costs for the organizational units:

*"Of course, when you release someone full-time, you have to "back staff" as we say, meaning hire someone temporarily who is going to do the job, and there are costs related to that, and this is not always well received [by organizational units]" [translation from French] (Expert #2).*

However, this mechanism is not used in small projects as it is complex and unproductive to release staff for a short period, and the IT-SSC may be faced with the need to intermittently "share" this resource with the organizational unit (Expert #2)

Because IT-SSCs centralize and focus on IT activities and because organizational units primarily focus on their core activities, introducing boundary practices can be complex and challenging. However, the interviewed experts stressed that it is extremely beneficial to use such EKBS mechanisms in large and complex IT projects. Thus, the interviews partially support the fourth element of the last research proposition.

## 6 Discussion

Based on the case study analysis and the interviews with IT-SSC experts, it seems that human capital is particularly strong and plays a key role in IT-SSCs, whereas relational capital and structural capital are less developed because of the monopolistic position IT-SSCs tend to hold and the user-pays principle they tend to apply. As proposed in the conceptual framework and the research propositions, IT-SSCs mobilize liaison officers (e.g., consultants and principals) and use boundary objects to allow EKBS. On the other hand, boundary discourses and boundary practices, although imperfect, seem to be of interest and are being developed to improve EKBS. Table 2 summarizes the main findings resulted from the case study analysis and the interviews with IT-SSC experts.

Analysis of the case study and the interviews suggests that IT-SSCs have strong human capital. In particular, the case study highlights the fact that organizational units seem to have limited IT knowledge. Therefore, it seems to be the business knowledge developed by consultants and principals in IT-SSCs which builds human capital [3]. Thus, by promoting a service culture, the IT-SSC at Uni-IT also developed its human capital as it worked with organizational units on a daily basis to guide them through the IT development process. The interviews with the two experts underscore the fact that IT-SSCs with low employee turnover rates can optimize human capital by developing solid and concrete knowledge of their clients' business needs and contexts.

The data analysis shows that the monopoly position of IT-SSCs seems to diminish the influence of organizational units on decision-making and negatively impact structural capital. However, the experts revealed a more nuanced perspective on this matter. However, they stated that this would not be the case for IT-SSCs where processes are less standardized and more flexible, which facilitates the participation of organizational units in decision-making.

According to the case study, the use of "quotes" to transparently show the costs of a project had a negative impact on the relationship between the IT-SSC and its clients. Organizational units were able to compare prices with the external market. The IT-SSC therefore had to constantly justify its prices in response to its customers' complaints. The interviews with the two experts also highlighted the fact that the user-pays principle undeniably had a negative impact on relational capital and that it put pressure on IT-SSCs to minimize their costs. Nevertheless, the user-pays principle is not automatically applied by all IT-SSCs. Some IT-SSCs do not use the user-pays principle in order to optimize the quality of the relationship between the IT-SSC and other organizational units. Yet such a situation would convey to the organizational units the idea that services are free. To overcome this impression that services are free, experts advise that, at the least, a "show back" principle should be applied, to educate clients.

In the case study, consultants and principals were mobilized to bridge the gap between the IT-SSC and the organizational units. They translated the client's needs for the IT-SSC and the IT-SSC's specifications and constraints for the organizational units. The two experts not only highlighted the importance of selecting senior analysts as liaison officers, but also discussed using a liaison officer who comes directly from the organizational unit receiving services. Representatives of the organizational units who worked with the IT-SSC on a recurring basis developed the capacity to translate the discourse of the IT-SSC for other users.

IT-SSCs tend to mobilize boundary objects to promote EKBS. In the case study, we found that quotes and e-mails were used as boundary objects. During the interviews with experts, several boundary objects were mentioned, including statements of work, functional analyses and prototypes.

<b>Propositions</b>	<b>From the Case Study Analysis</b>	<b>From the Interviews with Experts</b>
<b>#1 - Human Capital</b>	- HC is paramount at Uni-IT and is reflected in the valorization of the service culture which underscores the need for the IT-SSC to understand the needs of the organizational units	-IT-SSCs have strong human capital. -A low turnover rate for employees of IT-SSCs can promote a high level of human capital. - A decentralized IT-SSC would facilitate the development of strong human capital.
<b>#2 - Structural Capital</b>	-The monopoly position of the IT-SSC with respect to organizational units has a negative impact on structural capital.	-The monopoly position of the IT-SSC with respect to organizational units has a negative impact on structural capital only when the IT-SSC is "balanced." -The monopoly position of the IT-SSC with respect to organizational units would not have a negative impact on the structural capital when the IT-SSC is decentralized.
<b>#3 - Relational Capital</b>	-The user-pays principle had a negative impact on relational capital. The constant price justification and the comparison with services offered on the market created tension (lack of trust) during interactions. This principle put additional pressure on an IT-SSC to minimize the prices of services offered.	-The user-pays principle is not automatically used in all IT-SSCs. - When the user pays principle is used in an IT-SSC, it is true that this principle has a negative impact on relational capital and places additional pressure on the IT-SSC to minimize prices.
<b>#4a - Boundary Spanner</b>	- IT-SSC tends to mobilize liaison officers (consultants) to promote EKBS.	IT-SSCs tend to mobilize liaison officers and organizational units can also mobilize liaison officers to represent them.
<b>#4b - Boundary Object</b>	-IT-SSCs tend to mobilize boundary objects (service quotations) to promote EKBS.	-IT-SSCs tend to mobilize boundary objects to promote EKBS. IT-SSCs can use an IS development methodology to structure the use of boundary objects.
<b>#4c - Boundary Discourse</b>	-IT professionals made the effort to eliminate IT jargon when communicating with users.	-IT-SSCs tend to favor boundary discourse less as a mechanism for optimizing EKBS. -It is less critical to develop an effective boundary discourse when the IT-SSC deals with the same representatives of organizational units on a recurring basis.
<b>#4d - Boundary Practice</b>	- no boundary practices at Uni-IT since the main objective of an IT-SSC was to centralize IT services by standardizing processes and developing IT expertise.	-IT-SSCs tend to favor boundary practices only in the context of major projects.

**Table 2. Synthesis of Findings**

According to the case study and the interviews, using boundary discourses to promote EKBS seems to be challenging. In the case study, the IT-SSC realized how difficult it was to promote an effective boundary discourse. The experts also highlighted this challenge but relativized its importance by indicating that certain strategies, such as dealing with the same representatives from organizational units, would allow representatives to better understand IT jargon and would minimize the need to develop the IT-SSC's capacity to "vulgarize" its discourse.

The two experts agreed that IT-SSCs should make little use of border practices, as such practices are relatively costly and can create inconveniences for some organizational units (hiring new staff for a specific time period). However, it appears that such practices have been efficiently used in major projects. For example, the cost of releasing employees so they can work directly in the IT-SSC during a major project may be smaller than the inconvenience experienced by organizational units trying to fulfill their primary responsibilities.

## 7 Further Empirical Validation of the Conceptual Framework

The next step in our study is to empirically validate our conceptual framework by using a multi-case study method. We will adopt an explanatory theory-building-from-cases approach [10]. An explanatory approach seeks to find relationships between an “observed state of a phenomenon and conditions that influence its development” [2, p. 428]. Following Eisenhardt’s [10] methodological recommendations, we will anchor our preliminary construct specification in the extant literature and we will craft our data collection instruments and protocols on the basis of this literature, following a deductive pattern. This will be followed, after our entry in the field, by a “flexible and opportunistic” [10, p. 533] data collection approach, and a within-case and cross-case data analysis, which are inductive in nature.

We will use a multiple-case design and will select the cases applying a logic of replication, maximizing variation, thus predicting “contrasting results but for predictable reasons” [38, p.47], yet allowing comparison. Interviews will be the main method of data collection. In line with our theory building approach, we will remain open to the exploration of new topics and themes during data collection [10]. Following our theory building approach, we will triangulate the interview with archival sources, including project documentation and other organization documents. We will perform within-case and cross-case analyses. Cross-case analysis will be conducted by using methods suggested by Eisenhardt [10], as the cases will be compared to identify similarities and differences between them.

## 8 Conclusion

This paper contributes first to the breadth of the scientific literature on SSCs. In particular, it has helped deepen understanding of concepts related to knowledge management in the context of IT-SSCs. A conceptual framework and research propositions related to EKBS and intellectual capital within the context of IT-SSCs are proposed. The study also shows how EKBS mechanisms and the components of intellectual capital could affect IT-SSCs. A second contribution is made to the field of knowledge management. This study analyses several concepts within the context of an IT-SSC using the perspective of knowledge being embedded integrated into practice [25]. Our data analysis suggests that there is mutual interaction between intellectual capital and EKBS mechanisms.

Concerning practitioners, this study is undeniably a resource for IT managers working in the world of IT-SSCs. Our analysis suggests that it is essential that practitioners understand EKBS mechanisms and the components of intellectual capital that characterize their organization. The results of this study will guide them in the evaluation of these mechanisms. Their assessment will allow them to optimize EKBS between their SSC and organizational units and to simultaneously encourage innovation in the development of new systems by optimizing the level of users' involvement in the development process.

Although this paper makes a contribution to the fields of IT and knowledge management, it also has limitations. First, the study's results cannot be generalized because it relies on an illustrative case study and two interviews. As emphasized by Eisenhardt [10], case-building theory can result in narrow and idiosyncratic theory. Nevertheless, this illustrative case study has allowed us to better understand certain phenomena that have not been studied in the context of an IT-SSC. A second limitation of this study is that the case study data had previously been collected for different research purposes.

## References

1. Amiruddin, R., Aman, A., Sofiah, Auzair, M., Hamzah, N., and Maelah, R. 2013. "Mitigating Risks in a Shared Service Relationship: The Case of a Malaysian Bank," *Qualitative Research in Accounting & Management* (10:1), pp. 78-93.
2. Avgerou, C. 2013. "Explaining Trust in IT-mediated Elections: A Case Study of e-Voting in Brazil," *Journal of the Association for Information Systems*, (14:8), pp. 420-451.
3. Bassellier, G., and Benbasat, I. 2004. "Business Competence of It Professionals: Conceptual Development and Influence on IT-Business Partnerships," *MIS Quarterly* (28:4), pp. 673-694.
4. Bergeron, B. 2003. *Essentials of Shared Services*. John Wiley & Sons.
5. Bontis, N. 1999. "Managing Organizational Knowledge by Diagnosing Intellectual Capital: Framing and Advancing the State of the Field," *International Journal of Technology Management* (18:5-8), pp. 433-462.
6. Carlile, P. R. 2004. "Transferring, Translating, and Transforming: An Integrative Framework for Managing Knowledge across Boundaries," *Organization Science* (15:5), pp. 555-568.

7. Cook, S. D., and Brown, J. S. 1999. "Bridging Epistemologies: The Generative Dance between Organizational Knowledge and Organizational Knowing," *Organization Science* (10:4), pp. 381-400.
8. Dibbern, J., Goles, T., Hirschheim, R., and Jayatilaka, B. 2004. "Information Systems Outsourcing: A Survey and Analysis of the Literature," *ACM Sigmis Database* (35:4), pp. 6-102.
9. Eisenhardt, K. M. 1989a. "Agency Theory: An Assessment and Review," *Academy of Management Review* (14), pp. 57-74.
10. Eisenhardt, K. M. 1989b. "Building Theories from Case Study Research," *Academy of Management Review* (14:4), pp. 532-550.
11. Feng, Y., Ye, H., and Pan, S. L. 2010. "Delivering Knowledge across Boundaries: A Process Model of Knowledge Delivery in Offshoring Projects," *Proceedings of the 14th Pacific Asia Conference on Information Systems*, Taipei, Taiwan.
12. Hawkins, M. A., and Rezazade, M. H. 2012. "Knowledge Boundary Spanning Process: Synthesizing Four Spanning Mechanisms," *Management Decision* (50:10), pp. 1800-1815.
13. He, J., and King, W. R. 2008. "The Role of User Participation in Information Systems Development: Implication from a Meta-Analysis," *Journal of Management Information Systems* (25:1), pp. 301-331.
14. Herbert, I., and Seal, W. 2014. "A Knowledge Management Perspective to Shared Service Centers: A Case Study of a Finance SSC," in *Shared Services as a New Organizational Form*. Emerald Publishing, pp. 133-151.
15. Hsu, J. S.-C., Chu, T.-H., Lin, T.-C., and Lo, C.-F. 2014. "Coping Knowledge Boundaries between Information System and Business Disciplines: An Intellectual Capital Perspective," *Information & Management* (51:2), pp. 283-295.
16. Janssen, M., and Joha, A. 2004. "Issues in Relationship Management for Obtaining the Benefits of a Shared Service Center," *Proceedings of the 6th international conference on Electronic commerce*: ACM, pp. 219-228.
17. Janssen, M., and Joha, A. 2006. "Motives for Establishing Shared Service Centers in Public Administrations," *International Journal of Information Management* (26:2), pp. 102-115.
18. Janssen, M., and Wagenaar, R. 2004. "An Analysis of a Shared Services Centre in E-Government," *Proceedings of the 37th Hawaii International Conference on System Sciences*, HI.
19. Joha, A., and Janssen, M. 2011. "Types of Shared Services Business Models in Public Administration," *Proceedings of the 12th Annual International Digital Government Research Conference: Digital Government Innovation in Challenging Times*: ACM, pp. 26-35.
20. Joha, A., and Janssen, M. 2014. "Factors Influencing the Shaping of Shared Services Business Models: Balancing Customization and Standardization," *Strategic Outsourcing: An International Journal* (7:1), pp. 47-65.
21. Kern, T., and Willcocks, L. 2002. "Exploring Relationships in Information Technology Outsourcing: The Interaction Approach," *European Journal of Information Systems* (11:1), pp. 3-19.
22. Knol, A., Janssen, M., and Sol, H. 2014. "A Taxonomy of Management Challenges for Developing Shared Services Arrangements," *European Management Journal* (32:1), pp. 91-103.
23. Lacity, M., and Fox, J. 2008. "Creating Global Shared Services: Lessons from Reuters," *MIS Quarterly Executive* (7:1), pp. 17-32.
24. Lacity, M., Yan, A., and Khan, S. 2017. "Review of 23 Years of Empirical Research on Information Technology Outsourcing Decisions and Outcomes," *Proceedings of the 50th Hawaii International Conference on System Sciences*, HI.
25. Levina, N., and Vaast, E. 2005. "The Emergence of Boundary Spanning Competence in Practice: Implications for Information Systems' Implementation and Use," *MIS Quarterly* (29:2), pp. 335-363.
26. Levina, N., and Vaast, E. 2008. "Innovating or Doing as Told? Status Differences and Overlapping Boundaries in Offshore Collaboration," *MIS Quarterly* (32:2), p. 307-324.
27. Minnaar, R. A., and Vosselman, E. G. 2013. "Shared Service Centres and Management Control Structure Change: Exploring the Scope and Limitations of a Transaction Cost Economics Approach," *Journal of Accounting & Organizational Change* (9:1), pp. 74-98.
28. Olsen, T. J. 2012. *Realizing Shared Services – A Punctuated Process Analysis of a Public IT Department*. Dissertation, Georgia State University.
29. Schulz, V., Herz, T., Rothenberger, M. A., and Brenner, W. 2010. "It Shared Service Center and External Market Activities," *Proceedings of the 16<sup>th</sup> Americas Conference on Information Systems*, Lima, Peru.
30. Schulz, V., Hochstein, A., Uberrickel, F., and Brenner, W. 2009. "Definition and Classification of It-Shared-Service-Center," *Proceedings of the 16<sup>th</sup> Americas Conference on Information Systems*, San Francisco, CA.



31. Stewart, T. 1997. "Intellectual Capital: The New Wealth of Organizations." Doubleday Business, p. 304.
32. Templier, M., and Paré, G. 2015. "A Framework for Guiding and Evaluating Literature Reviews," *Communication of the AIS* (37), pp. 113-137.
33. Tomasino, A. P., Fedorowicz, J., Williams, C. B., Gentner, A. A., and Hughes, T. T. 2014. "Embracing System Complexity in a Shared Service Center Collaboration," *MIS Quarterly Executive* (13:2), p. 63-75.
34. Ulbrich, F. 2006. "Improving Shared Service Implementation: Adopting Lessons from the BPR Movement," *Business Process Management Journal* (12:2), pp. 191-205.
35. Ulbrich, F., and Schulz, V. 2014. "Seven Challenges Management Must Overcome When Implementing IT-Shared Services," *Strategic Outsourcing: An International Journal* (7:2), pp. 94-106.
36. Vieru, D., and Arduin, P.-E. 2016. "Sharing Knowledge in a Shared Services Center Context: An Explanatory Case Study of the Dialectics of Formal and Informal Practices," In Kotlarsky, J., Oshri, I., and Willcocks, L. (dir.), *Shared Services and Outsourcing: A Contemporary Outlook*, LNBIP, vol. 266, p. 19-39, Springer.
37. Vieru, D., and Rivard, S. 2015. "Knowledge Sharing Challenges During Post-Merger Integration: The Role of Boundary Spanners and of Organizational Identity," *International Journal of Business and Management* (10:11), p. 1-12.
38. Yin, R. 2003. *Case study research: Design and methods*. Sage Publications, Inc.